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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/531,931

04/19/2005

Gerard De Haan

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS

P.O. BOX 3001

BRIARCLIFF MANOR, NY 10510

EXAMINER

TORRES, JOSE

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

07/02/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/531,931

Applicant(s)

DE HAAN ET AL.

Examiner

JOSE M. TORRES

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Comments

1. The Amendment – After Non-Final Rejection filed on February 19, 2009 has been entered and made of record.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1, 2, 4-9 and 13-16 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows.

Claims 1 and 15 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter as follows. Claims 1 and 15 defines an image processing unit. However, the body of the claim lacks definite structure indicative of a physical apparatus. Furthermore, the specification indicates that the invention may be embodied as pure software (Page 10 lines 24-31). Therefore, the claim as a whole appears to be nothing more than a system of software elements, and software per se does not fall within a statutory category. Claims 2, 4-9, 14 and 16, depend upon claims 1 and 15, respectively.

Claim 13 is rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. The Federal Circuit¹, relying upon Supreme Court precedent², has indicated that a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the "machine or transformation test", whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590"). While the instant claim recite a series of steps or acts to be performed, the claim neither transform an article nor are positively tied to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. That is, there is no particular machine (such as a computer processor) required for the claimed steps, nor there exists a claimed depiction of the transformed data (output image), therefore, non-statutory.

Appropriate correction is required.

¹ *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

² *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2 and 4-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yang et al. (U.S. Pat. No. 7,042,512) in view of Demos (U.S. Pat. No. 6,442,203).

As to claims 1, 13 and 15, Yang et al. teaches An image processing unit/method for computing a sequence of output images on basis of a sequence of input images, comprising: - a motion estimation unit (FIG. 4, "Motion Estimation Unit 410") for computing a motion vector field (FIG. 6A, "motion vectors of a video image") on basis of the input images ("($n-1$)-th and ($n+1$)-th fields"), the motion vector field comprising a first motion vector belonging to a first group of pixels and a second motion vector belonging to a second group of pixels (Col. 3 line 58 through Col. 4 line 8 and line 54 through Col. 5 line 6); - a quality measurement unit (FIG. 4, "Motion Estimation Unit 410") for computing a value of a quality measure for the motion vector field ("accuracy of each motion vector in the field to be interpolated", Col. 3 line 62 through Col. 4 line 8); - an interpolation unit (FIG. 4, "Motion Compensated Interpolation Unit 440 and Spatio-Temporal Interpolation Unit 450") for computing a first one of the output images by means of interpolation of pixel values of the input images, the interpolation being based on the motion vector field (Col. 4 lines 22-30); and - control means to control the

interpolation unit (FIG. 4, "Adaptive Selection Unit 460") on basis of the quality measure ("motion type" and "accuracy", Col. 4 lines 31-41 and Col. 5 lines 59-67).

However, Yang et al. fails to teach the interpolation unit is arranged to perform a motion compensated interpolation of the pixel values of the input images on basis of the motion vector field, if the value of the quality measure is lower than a predetermined threshold and is arranged to perform an alternative interpolation of the pixel values of the input images, if the value of the quality measure is higher than the predetermined threshold; and the quality measurement unit is arranged to compute the value of the quality measure on basis of a maximum difference between the first motion vector and the second motion vector.

Demos teaches the interpolation unit ("at least one processor") is arranged to perform a motion compensated interpolation ("motion-compensated" image) of the pixel values of the input images on basis of the motion vector field (Col. 14 lines 34-44), if the value of the quality measure ("confidence measures and factor") is lower than a predetermined threshold ("threshold") and is arranged to perform an alternative interpolation ("a fall back value") of the pixel values of the input images, if the value of the quality measure is higher than the predetermined threshold; and the quality measurement unit is arranged to compute the value of the quality measure on basis of a maximum difference between the first motion vector and the second motion vector ("local gradient of the motion vector picture", Col. 17 line 53 through Col. 18 line 14, Col. 21 lines 36-42, Col. 23 lines 27-62).

Therefore, in view of Demos, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Yang et al. by incorporating the processor for performing a motion-compensated interpolation or an alternative (fall back) interpolation for the output image pixel values based on the behavior of the confidence measure and factor of the motion vectors, such that when a good match can not be found, as determined by thresholds, and if no high confidence motion vectors are available, a fall back interpolation is performed, and otherwise a motion-compensated interpolation is performed in order to preserve the temporal clarity of high amplitude details in interlace images, while reducing overall picture interlace artifacts, and aid to image segmentation when moving objects are involved in image analysis (Col. 17 line 37 through Col. 18 line 14).

As to claims 2 and 16, Yang et al. teaches the first group of pixels is a neighboring group of pixels of the second group of pixels (As depicted in at least Figure 6A, the vectors shown belongs to neighboring groups. Col. 4 line 56 through Col. 5 line 6).

As to claim 4, Demos teach the alternative interpolation comprises a non-motion compensated interpolation ("fall back value", Col. 21 lines 36-51).

As to claim 5, Demos teaches the alternative interpolation comprises a replication of the pixel values of the input images ("default values", Col. 21 lines 36-51).

As to claim 6, Demos teaches the quality measurement unit is arranged to compute the value of the quality measure on basis of a maximum difference between the horizontal component of the first motion vector and the horizontal component of the second motion vector (Since the local gradient of the motion vector picture indicates motion, and the motion picture image is an RGB image with the R component representing an X coordinate of a motion vector, the G component representing the Y component of a motion vector and the B component for the confidence factor, the difference between the horizontal components is performed, see Col. 7 line 55 through Col. 8 line 27 and Col. 17 line 53 through Col. 18 line 14).

As to claim 7, Yang et al. teaches the first group of pixels is located horizontally from the second group of pixels (Similar to claim 2 above, and s depicted in at least Figure 6A, the groups are located horizontally among each other. Col. 4 line 56 through Col. 5 line 6).

As to claim 8, Demos teach the predetermined threshold is an adaptive threshold ("pixel thresholds based upon knowledge of the type of images", Col. 17 lines 27-53).

As to claim 9, Demos teaches the adaptive threshold is based on match errors ("empirically determined") being computed for the first and second motion vectors (Col. 17 lines 37-52).

As to claim 10, Demos teaches an image processing apparatus ("programmable system") comprising: - receiving means ("one input device") for receiving a signal ("input data") corresponding to a sequence of input images; and - an image processing unit ("processor") for computing a sequence of output images on basis of the sequence of input images, as claimed in claim 1 (Col. 23 lines 27-62).

As to claim 11, Demos teaches an image processing apparatus as claimed in claim 10, characterized in further comprising a display device for displaying the output images ("The output information is applied to one or more output devices, in known fashion.", Col. 23 lines 27-62. It is to be understood that an output device may be a high-definition television as described in Yang et al.).

As to claim 12, Demos teaches an image processing apparatus as claimed in claim 11, characterized in that it is a TV ("output device").

As to claim 14, Demos teaches the value of the adaptive threshold is relatively high when the match errors being computed for the first and second motion vectors are relatively low (The confidence measure break down considers the case when the matches are poor and since the threshold is empirically derived, as with any optimization algorithm, minimizing the error is one goal, see Col. 8 lines 27-41, Col. 15 line 65 through Col. 16 line 11 and Col. 17 lines 37-52).

Response to Arguments

Priority

6. A copy of the International Application (PCT/IB03/04352) has been received for this National Stage Application as required under 35 U.S.C. § 371.

Abstract

7. A new Abstract of the Disclosure has been provided on a separate sheet in accordance with 37 C.F.R. § 1.52(b)(4). Therefore, the objection has been withdrawn.

Specification

8. Applicants respectfully decline to amend the specification to include Section headings in order to illustrate the preferred layout for a Specification of a Utility Patent Application. Therefore, the objections have been withdrawn.

Claim Rejections under 35 U.S.C. §§ 102 and 103

9. Applicant's arguments, with respect to the rejections of claims 1-3 under 35 U.S.C. §§ 102 and 103, have been fully considered and are persuasive. Therefore, the rejections have been withdrawn. However, upon further consideration, a new grounds of rejection is made over Yang et al. in view of Demos.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lin et al. disclose a Method for Motion Pixel Detection with Adaptive Thresholds, Jiang et al. teaches a Motion Adaptive Deinterlacing, and Kokkosoulis et al. disclose a Dynamic Video De-interlacing.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOSE M. TORRES whose telephone number is (571)270-1356. The examiner can normally be reached on M-F: 8:00am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jose M. Torres/

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06/11/2009

Examiner, Art Unit 2624

/Aaron W Carter/

Primary Examiner, Art Unit 2624